TABLE 5 – TENSION DEVELOPMENT AND LAP SPLICE LENGTHS FOR BARS IN WALLS AND SLABS

BAR SIZE	LAP CLASS	f'c = 7000 psi															
		CONCRETE COVER = 0.75"				CONCRETE COVER = 1.00"				CONCRETE COVER = 1.50"				CONCRETE COVER = 2.00"			
		UNCOATED		EPOXY-COATED[10]		UNCOATED		EPOXY-COATED[10]		UNCOATED		EPOXY-COATED[10]		UNCOATED		EPOXY-COATED[10]	
		TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER
#3	A	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
(#10)	B	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
#4	A	14	12	19	17	12	12	15	13	12	12	14	12	12	12	14	12
(#13)	B	19	16	24	21	16	16	19	17	16	16	18	16	16	16	18	16
#5	A	21	16	27	24	17	13	22	20	14	12	19	17	14	12	17	13
(#16)	B	27	21	35	31	22	17	29	25	19	16	24	21	19	16	22	17
#6	A	28	22	37	33	23	18	30	27	17	13	22	20	17	13	22	20
(#19)	B	37	28	48	42	30	23	39	35	22	17	29	26	22	17	29	26
#7	A	45	35	–	–	38	29	–	–	28	22	–	–	25	19	–	–
(#22)	B	59	45	–	–	49	38	–	–	36	28	–	–	32	25	–	–
#8	A	56	43	–	–	47	36	–	–	35	27	–	–	28	22	–	–
(#25)	B	73	56	–	–	61	47	–	–	46	35	–	–	37	28	–	–
#9	A	68	52	–	–	57	44	–	–	44	34	–	–	35	27	–	–
(#29)	B	88	68	–	–	74	57	–	–	56	44	–	–	46	35	–	–
#10	A	82	63	–	–	69	53	–	–	53	41	–	–	43	33	–	–
(#32)	B	106	82	–	–	90	69	–	–	69	53	–	–	56	43	–	–
#11	A	96	74	–	–	82	63	–	–	63	49	–	–	52	40	–	–
(#36)	B	125	96	–	–	106	82	–	–	82	63	–	–	67	52	–	–

BASED ON ACI 318-05, SECTION 12.2 & 12.15

TABLE 6 – TENSION DEVELOPMENT LENGTHS OF STANDARD HOOKS AND ASTM A970 TERMINATORS FOR UNCOATED BARS

BAR SIZE	LENGTHS (in.) PER CONCRETE STRENGTH (psi)				
	4000 psi	5000 psi	6000 psi	7000 psi	8000 psi
#3 (#10)	7	7	6	6	6
#4 (#13)	10	9	8	7	7
#5 (#16)	12	11	10	9	9
#6 (#19)	15	13	12	11	10
#7 (#22)	17	15	14	13	12
#8 (#25)	19	17	16	15	14
#9 (#29)	22	19	18	16	15
#10 (#32)	24	22	20	19	17
#11 (#36)	27	24	22	21	19
#14 (#43)	32	29	27	25	23
#18 (#57)	43	39	35	33	31

BASED ON ACI 318-05, SECTION 12.5

TABLE 7 – TENSION DEVELOPMENT LENGTHS OF STANDARD HOOKS AND ASTM A970 TERMINATORS FOR EPOXY-COATED BARS[10]

BAR SIZE	LENGTHS (in.) PER CONCRETE STRENGTH (psi)				
	4000 psi	5000 psi	6000 psi	7000 psi	8000 psi
#3 (#10)	9	8	7	7	6
#4 (#13)	12	10	10	9	8
#5 (#16)	15	13	12	11	10
#6 (#19)	17	16	14	13	12

BASED ON ACI 318-05, SECTION 12.5

TABLE 8 – COMPRESSION DEVELOPMENT AND LAP SPLICE LENGTHS FOR UNCOATED AND EPOXY-COATED BARS

BAR SIZE	LENGTHS (in.) PER CONCRETE STRENGTH (psi)					
	4000 psi	5000 psi	6000 psi	7000 psi	8000 psi	LAP SPLICE
#3 (#10)	8	8	8	8	8	12
#4 (#13)	10	9	9	9	9	15
#5 (#16)	12	12	12	12	12	19
#6 (#19)	15	14	14	14	14	23
#7 (#22)	17	16	16	16	16	27
#8 (#25)	19	18	18	18	18	30
#9 (#29)	22	21	21	21	21	34
#10 (#32)	24	23	23	23	23	38
#11 (#36)	27	26	26	26	26	43
#14[5] (#43)	32	31	31	31	31	N/A
#18[5] (#57)	43	41	41	41	41	N/A

BASED ON ACI 318-05, SECTION 12.3 & 12.16

TABLE 9 – TENSION DEVELOPMENT AND LAP SPLICE LENGTHS FOR PLAIN WELDED WIRE FABRIC

WIRE	WIRE SPACING	DEVELOPMENT LENGTH (IN.) PER CROSS WIRE SPACING (IN.)				LAP SPLICE LENGTH (IN.) PER CROSS WIRE SPACING (IN.)			
		4	6	8	12	4	6	8	12
WO.5 TO WG	4	6	6	6	6	6	8	10	14
	6	6	6	6	6	6	8	10	14
	12	6	6	6	6	6	8	10	14

BASED ON ACI 318-05, SECTION 12.19

NOTES:

1. TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING BARS CONFORMING TO ASTM A615 OR A706 AND NORMAL WEIGHT CONCRETE.
2. TABULATED VALUES FOR BEAMS AND COLUMNS ARE BASED ON TRANSVERSE REINFORCEMENT MEETING MINIMUM CODE REQUIREMENTS.
3. CASES 1, 2, AND 3 ARE DEFINED AS FOLLOWS:
   A. CASE 1: COVER AT LEAST $2.0d_b$ AND C-C SPACING AT LEAST $5.0d_b$
   B. CASE 2: COVER AT LEAST $1.0d_b$ AND C-C SPACING AT LEAST $3.0d_b$
   C. CASE 3: COVER LESS THAN $1.0d_b$ AND/OR C-C SPACING LESS THAN $3.0d_b$ BUT $2.0d_b$ MIN.
4. LAP SPLICE LENGTHS ARE MULTIPLES OF TENSION DEVELOPMENT LENGTHS; CLASS A = 1.0 l_d AND CLASS B = 1.3 l_d
5. LAP SPLICES OF #14 AND #18 BARS ARE NOT ALLOWED. TABULATED VALUES ARE TENSION DEVELOPMENT LENGTHS.
6. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW.
7. FOR LIGHTWEIGHT AGGREGATE CONCRETE MULTIPLY TABULATED VALUES BY 1.3.
8. WHEN LAPPING A SMALLER BAR WITH A LARGER DIAMETER BAR USE THE LAP LENGTH FOR THE SMALLER DIAMETER BAR OR TENSION DEVELOPMENT LENGTH OF LARGER BAR, WHICHEVER IS GREATER.
9. ( ) INDICATES METRIC BAR SIZE (mm).
10. EPOXY COATING OF BARS LARGER THAN #6 IS NOT ALLOWED.
11. TABULATED VALUES APPLY ONLY TO INDIVIDUAL BARS IN COLUMNS AND NOT TO BUNDLED BARS. BUNDLED BARS ARE GROUPS OF PARALLEL REINFORCING BARS, NO MORE THAN FOUR, BUNDLED IN CONTACT TO ACT AS A UNIT. LAP SPLICES ARE NOT ALLOWED FOR BUNDLED BARS AND MECHANICAL SPLICES MUST BE USED. SEE COLUMN SCHEDULE SHEET FOR ADDITIONAL REQUIREMENTS.

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100% REVIEW SUBMISSION (NOT FOR CONSTRUCTION)	04/11/11
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